CLAIMS

1. A method for operating a cryogenic tunnel through which products to be chilled or deep-frozen pass, which tunnel is equipped with means for injecting a cryogenic fluid as well as means for extracting, at a variable rate, some or all of the cold gases resulting from the vaporization of said fluid in the tunnel, characterized in that:

a) at least one temperature probe (21/22) is provided outside the tunnel, in proximity to its entry and/or its exit, which is capable of providing a value $T_{entry/exit}$ of the temperature of the gases at the point where it is located;

b) at least one temperature probe (23) is provided outside the tunnel, which is capable of providing a value T_{amb} of the ambient temperature of the premises where the tunnel is operating;

c) the difference $T_{amb-entry/exit}$ between said ambient temperature T_{amb} and said temperature $T_{entry/exit}$ is determined, or alternatively the difference between the average of the ambient temperatures which are provided by said ambient temperature probes and the average of said temperatures $T_{entry/exit}$ which are provided by said entry/exit temperature probes;

d) the value of the temperature difference provided by step c) is compared (30) with a predetermined setpoint value $T^0_{amb-entry/exit}$;

e) the extraction rate of said extraction means (3) is controlled by feedback as a function of the result of the comparison in step d), in order to restore the value of said temperature difference to said setpoint value $T^0_{amb-entry/exit}$ if necessary.

2. The operating method as claimed in claim 1, characterized in that regulation of the PID type is used in order to carry out said feedback in step e).

3. The operating method as claimed in claim 1 or 2, characterized in that one or more gas equilibration valves (20) are provided inside the tunnel, which is/are capable of directing the cold gases to the entry

or the exit of the tunnel and can be actuated automatically from outside the tunnel.

4. The operating method as claimed claim 3, characterized by the implementation of the following steps:

i) at least one temperature probe is provided outside the tunnel, in proximity to its exit, which is capable of providing a value T_{exit} of the temperature of the gases at the point where it is located, and at least one temperature probe is provided outside the tunnel, in proximity to its entry, which is capable of providing a value T_{entry} of the temperature of the gases at the point where it is located;

j) the difference $T_{exit-entry}$ between said temperature T_{exit} and said temperature T_{entry} is determined, or the difference between the average of the temperatures T_{exit} which are provided by said exit temperature probes and the average of said temperatures T_{entry} which are provided by said entry temperature probes;

k) the value of the temperature difference provided by step j) is compared with a predetermined setpoint value $T^0_{exit-entry}$;

l) the orientation of some or all of said equilibration valves is controlled by feedback as a function of the result of the comparison in step k), in order to direct some or all of the cold gases contained in the tunnel so as to restore the value of said temperature difference to said setpoint value $T^0_{exit-entry}$ if necessary.

5. The operating method as claimed in claim 4, characterized in that regulation of the PID type is used in order to carry out said feedback in step l).

6. The operating method as claimed in one of the preceding claims, characterized in that said extraction means on which the feedback is carried out comprise a single extraction line located inside the tunnel, substantially above the region where the products enter.

7. A device for operating a cryogenic tunnel through which products to be chilled or deep-frozen pass, which tunnel is equipped with means for injecting a cryogenic fluid as well as means for extracting, at a variable rate, some or all of the cold gases resulting from the vaporization of said fluid in the tunnel, comprising:

a) at least one temperature probe (21/22) located outside the tunnel, in proximity to its entry and/or its exit, which is capable of providing a value $T_{entry/exit}$ of the temperature of the gases at the point where it is located;

b) at least one temperature probe (23) located outside the tunnel, which is capable of providing a value T_{amb} of the ambient temperature of the premises where the tunnel is operating;

c) a data acquisition and processing unit (30) capable of determining the difference $T_{amb-entry/exit}$ between said ambient temperature T_{amb} and said temperature $T_{entry/exit}$, or alternatively the difference between the average of the ambient temperatures which are provided by said ambient temperature probes and the average of said temperatures $T_{entry/exit}$ which are provided by said entry/exit temperature probes, of comparing the value of the temperature difference provided by the previous step with a predetermined setpoint value $T^0_{amb-entry/exit}$, and of optionally controlling the extraction rate of said extraction means by feedback as a function of the result of the previous comparison, in order to restore the value of said temperature difference to said setpoint value $T^0_{amb-entry/exit}$ if necessary.

8. The operating device as claimed in claim 7, characterized in that said data acquisition and processing unit uses a regulator of the PID type in order to carry out said feedback.

9. The operating device as claimed in claim 7 or 8, characterized in that it comprises one or more gas equilibration valves (20) inside the tunnel, which is/are capable of directing the cold gases to the entry

or the exit of the tunnel and can be actuated automatically from outside the tunnel.

10. The operating device as claimed in claim 8, characterized in that it comprises:

i) at least one temperature probe located outside the tunnel, in proximity to its exit, which is capable of providing a value T_{exit} of the temperature of the gases at the point where it is located, and at least one temperature probe located outside the tunnel, in proximity to its entry, which is capable of providing a value T_{entry} of the temperature of the gases at the point where it is located;

j) a data acquisition and processing unit capable of determining the difference $T_{exit-entry}$ between said temperature T_{exit} and said temperature T_{entry}, or the difference between the average of the temperatures T_{exit} which are provided by said exit temperature probes and the average of said temperatures T_{entry} which are provided by said entry temperature probes, of comparing the value of the temperature difference provided by the previous step with a predetermined setpoint value $T^0_{exit-entry}$, and of optionally controlling the orientation of some or all of said equilibration valves by feedback as a function of the result of the previous comparison, in order to direct some or all of the cold gases contained in the tunnel so as to restore the value of said temperature difference to said setpoint value $T^0_{exit-entry}$ if necessary.

11. The device as claimed in claim 10, characterized in that said data acquisition and processing unit uses a regulator of the PID type in order to carry out said feedback.

12. The operating device as claimed in one of claims 7 to 11, characterized in that said extraction means on which the feedback is carried out comprise a single extraction line located inside the tunnel, substantially above the region where the products enter.

13. A cryogenic tunnel of the type through which products to be chilled or deep-frozen pass, which is equipped with means for injecting a cryogenic fluid as well as means for extracting, at a variable rate, some or all of the cold gases resulting from the vaporization of said fluid in the tunnel, characterized in that it comprises an operating device as claimed in any one of claims 7 to 12.